

Relevance of Currency Exposure in the Valuation of Single-country Closed-end Funds

Abraham Mulugetta^a, Dilip K. Ghosh^b, and Joseph Cheng^a

^a *Ithaca College*

^b *Rutgers University and Universiti Utara Malaysia*

ABSTRACT

The relevance of currency translation exposure on the valuation of single country closed end funds (SCCEFs) is examined, using net asset values (NAVs) and market prices of these funds - the two prices closed end funds have. Given differential information holding hypothesis, the size of assets and liabilities of closed end funds, and the method of computing net asset value, it is anticipated that changes in exchange rates will quickly be observed in the net asset values, and thereby influence the volatility of discounts or premiums of these funds. This study particularly focuses on daily movements of exchange rates, market prices and net asset values.

JEL: G150, F310

Keywords: Currency exposure; Currency crisis; Closed-end funds; Net asset value (NAV); Hedge

I. CURRENCY EXPOSURE

Currency exposure and the attendant risk on receivables, payables, revenues and costs as a result of change in exchange rates are unavoidable events that corporations have to learn to live with. The decision on how to manage the currency exposure depends on the management philosophy of each corporation, the level and types of exposure. To hedge or not to hedge transaction exposure revolves, among others, on the amount of net exposure, the volatility of the currency and the availability of instruments for hedging purposes. Economic exposure because of its long-term nature needs structural changes to influence inflows (revenues) and outflows (costs) to reduce the impact of changes in exchange rates. Survival and growth particularly of multinational corporations are linked on how effectively these two types of exposure are managed. However, when it comes to translation exposure the juries (academics and practitioners) are still out on its impact in the valuation of corporations. FASB#8 in earlier years and FASB#52 since 1980s have dealt with the issue of translation exposure and promulgated on how to recognize, adjust and report translation gains or losses in consolidated financial statements. The issue at hand is whether to hedge or not to hedge translation (or as some call it accounting) exposure. Translation exposure occurs when multinational corporations reinstate and translate their foreign subsidiaries financial statements and incorporate them in their consolidated financial statements. This accounting exercise is to report to the public an overall picture of the health of multinational corporations. It does not affect the cash inflows or outflows and as such it is strongly argued in some quarter that it is a paper or accounting exposure and irrelevant to take a costly hedging position. Others argue the translation gain or loss is included in the financial statement and the investing public may use it in the valuation of corporation and therefore translation exposure need to be hedged. In general the majority of the practitioners side on the irrelevance of translation exposure, as seen in their SEC filings, when it comes to the valuation of stock prices of corporations. This study argues the preeminence of translation exposure in the valuation of single country closed end funds (SCCEF) both in the determination of market prices and NAVs.

II. DISCOUNTS AND PREMIUMS IN SCCEFS

The study by Lee, Schleifer, and Thaler (1990) states that SCCEFs are populated by two types of investors: rational and noise investors. Unlike rational investors, noise traders' expectations about asset returns are partly influenced by their sentiments, which cause overestimation on asset return at some times and

underestimation at other times. It is reasoned that noise traders' overestimation and underestimation on returns are unpredictable in the eyes of the rational investors. Since the emotion-charged estimations tend to be correlated across noise traders, it is hard to deal with their estimates. As a result, the closed-end funds, which are largely comprised of individual investors, are subject to the systematic risk of such noise traders' sentiments. When this risk is priced at equilibrium, the funds are expected to earn higher returns in comparison to their fundamental values and, therefore, the funds tend to be under-priced. This is one of the reasons why closed-end funds may usually be discounted in comparison to NAV (Net Asset Value) of the funds. This study was challenged by Chen, Kan and Miller (1993a, 1993b), and subsequently improved by Chopra, Lee, Schleifer and Thaler (1993a, 1993b).

Although the "investor sentiment" argument is convincing, recent studies have pointed out that this argument still fails to explain the existence of persistent premiums of some funds represented by several Asian SCCEFs. The question that arises is how to explain the existence of persistent premium if the anomaly of SCCEF price is caused by the resale price risk attributed to individual investors' sentiment. This recent study turned to the "differential information holding" explanation. It has been argued that, in contrast to individual investors, closed-end fund (CEF) managers and institutional investors are likely to hold more accurate information (i.e. change in exchange rate) affecting the prices of securities that make up the SCCEFs. SCCEF market prices, being largely determined by individual investors, might not adjust to information as quickly and accurately as the NAVs, which are traditionally computed by fund management professionals. Individual investors' inability to accurately incorporate information into price (that is, over or underestimating) determines the magnitude/direction of fluctuations of discounts/premiums of SCCEFs.

III. TRANSLATION EXPOSURE AND COMPUTATION OF NAV

NAVs are calculated, as already pointed out, by management of SCCEFs. It is computed by taking the total assets of the single country closed end fund (ASCCEF), subtracting the liabilities (LSCCEF), and dividing the result by the number of shares outstanding (N) ($= (ASCCEF - LSCCEF)/N$). The obvious question to ask is the following: what triggers a change in NAV? The immediate answer is that NAV would change as a result of change in either the assets, liabilities, or the number of shares outstanding. The number of shares outstanding rarely changes in closed end funds, unlike that of open-end mutual funds. In closed end funds, once shares are issued, they are traded in the secondary market as any other securities issued by corporations. The liabilities of SCCEF are minuscule in magnitude in comparison to the assets. Therefore,

most of the changes that influence NAV are a result of change in the value of the assets. These assets are financial assets (equity securities). This is not to state that the value of the liabilities will remain constant. However, in the computation of NAV, the sheer size of the value of the assets dominates the value of the liabilities and thus the NAV.

NAV is computed and adjusted by management of SCCEF on a weekly and, recently (for some funds), on a daily basis. SCCEFs are made up of different securities within a specified single country. They are portfolios of securities where each security is traded in the issuing country while the portfolio is traded as SCCEF in another country, such as Hong Kong, U.K. and U.S. Similar to any other international portfolio investments, the performance of SCCEFs is influenced by general market conditions, regional economic conditions, exchange rates (mainly between the country where the securities of the SCCEF are and the country where they are traded) and interest of investors on SCCEFs, among others.

Change in exchange rates between the countries where the securities are issued and where they are traded triggers a change in NAV and market price of SCCEFs. The question that this study raises is which one of these prices, the NAV or the market price, efficiently incorporates the change in exchange rates? If we assume that professionals manage the SCCEFs, these professionals measure and input the impact of currency translation, transaction and economic exposures. Unlike subsidiaries of multinational corporations where currency translation exposure is argued by some to be irrelevant when consolidated financial statements are prepared, we propose here that translation exposure plays a significant role as economic and transaction exposures when it comes to SCCEFs. The assets of SCCEFs are mainly composed of securities of a single country. A change in exchange rates is going to affect the economic performance, the revenues and costs, of the firms that have issued the securities, and thereby the prices of the securities within the country. Similarly, depending upon the strategy adopted by management of closed end fund on the level of turnover of securities that make up the SCCEF, transaction exposure may also impact on the value of the assets. Finally, in the preparation of the balance sheet necessary to calculate the NAV, on a weekly or recently on a daily basis, the different accounts in the balance sheet are recalculated for the effect of currency translation exposure. It is hard to imagine that small investors that populate closed end funds will be going through this rigorous computation on a weekly or daily basis to efficiently price SCCEFs. Therefore, this study expects the NAV, which is computed by management of SCCEF, to lead in assessing, measuring and incorporating the influence of currency exposure.

The recent study by Mulugetta, Ghosh, and Mulugetta (1998a) closely examined the movements of discounts/premiums of thirty-four SCCEFs. The

study identified two distinctive patterns: the "Southeast Asian" pattern unique to the funds in crisis and the "Latin American" pattern unique to the funds least affected by the crisis. The SCCEFs of Indonesia, Malaysia, Singapore, Thailand and Japan represented the first pattern, where the discounts significantly shrank (or the premiums grew) due to the faster depreciation of the net asset value (NAV) in comparison to the reduction in price. From the differential information holding perspective, it is reasoned that during the currency crisis most individual investors faced difficulty in accurately understanding the speed and the magnitude of the depreciation of the currency and the values of the securities that made up the SCCEFs. As a result, the reduction of the SCCEF's price may not have occurred as quickly as the NAV, leading to shrinking discounts and widening premiums.

In contrast, the discounts of the Latin American funds widened during the crisis period due to faster growth of the NAVs in comparison to the market prices. In Latin America as well as in Taiwan, the securities that made up the SCCEFs remained strong and increased in value over the period studied despite the temporary depreciation of the local currencies. The depreciation appeared to be a sympathetic reaction rather than driven by fundamental economic forces. This reaction had been discerned more clearly by managers rather than by individual investors of SCCEFs. In this intriguing investment environment, it seemed difficult for individual investors to understand the speed and the magnitude of the appreciation or depreciation of the underlying securities. Thus, the increase in the SCCEF's price was smaller than the NAV, which widened the discounts. These macro-level analytical results were also supported by the regression analysis at the micro level. The movements of discounts/premiums of European SCCEFs were similar to those in Latin America, but were less distinctive than the Latin American funds.

IV. RESEARCH QUESTIONS

The present study examines the correlation of NAV, market price and change in exchange rate to see if NAVs lead market prices of SCCEFs? It is argued earlier that translation exposure is relevant to the valuation of SCCEFs, and according to the differential information holding hypothesis, closed-end fund managers are likely to quickly adjust NAV. SCCEF market prices, being largely determined by individual investors, might not adjust to information as quickly and accurately as the NAVs. Therefore it is expected that when the daily market prices, NAVs and exchange rates are studied that the NAV will be highly correlated to exchange rate. The study has focused on pre and during Asian currency crisis periods.

As discussed earlier, an SCCEF is a portfolio comprised mainly of securities of a specific country traded in another national market. This is similar

to that of a specific stock where trading occurs among investors, unlike that of open-end-mutual funds where investors buy from and sell to the management of the specific mutual fund. Since SCCEF is a portfolio of securities, for example, from Thailand, traded in the U.S., and given the number of shares outstanding is fixed, the appreciation of the dollar against the Thai baht will reduce the market price of the SCCEF. The appreciation of the dollar will now have more purchasing power in Thailand for goods, services, or securities, whereas Thai securities bundled as a portfolio, traded in the U.S., will command a lower price than the pre-dollar appreciation era. If SCCEF investors are reasonably rational, and then we expect that as currency depreciates against the dollar, the market price of SCCEF and NAV will also depreciate by the same magnitude all other things remaining the same. Thus, significant reductions in SCCEFs' prices and NAVs are expected to occur in the magnitude similar to the exchange rate change between the pre-crisis and the crisis periods.

It is also expected that the change in NAV and market price will be significantly explained by the movement of exchange rate after controlling for the changes in the other modeled variables. As any other international portfolio investments, the performance of SCCEFs is influenced by general market conditions, regional economic conditions, exchange rates (mainly between the country where the securities of the SCCEF are and the country where they are traded) and interest of investors on SCCEFs, among others. In the two regression models used in this study, these variables are included to extract the relationships that exist between NAV and exchange rate, and market price and exchange rate.

If SCCEF investors are rational investors, then we expect that as currency depreciates against the dollar, the market price of SCCEF and NAV will also depreciate as described above. However, if a significant number of SCCEF investors are noise traders who have less access to accurate information and are driven by sentiment, the market price of SCCEF may not be influenced by fundamental economic factors, including exchange rate, in the way described above. Particularly, amid of the currency crisis, individual investors may overreact to the situation by extremely overestimating or underestimating the change in the local currency rate against the dollar. If this is the case, we may expect that the market price of SCCEFs may not be significantly influenced by fundamental factors, including the change in exchange rate, in the way NAVs are affected by these factors.

V. TYPES OF DATA FOR THE STUDY

To examine these issues and explore further, *FundEdge* database has been studied to identify SCCEFs that have started disclosing daily NAV in 1996. In 1996 some SCCEFs started to disclose daily NAV. 13 funds were identified, and

only 8 fulfilled the requirements of the study in terms of other variables. These 8 SCCEFs have been examined from January 1, 1996 to June 30, 1997 (the pre-crisis period) and from July 1, 1997 to December 5, 1997 (the crisis period). For each, the daily opening, high, low and closing price and volume of shares traded have been collected. Corresponding to each SCCEF nation, exchange rates (opening, high, low and closing) have also been retrieved from the *Center for Trading and Analysis of Financial Instruments* at Ithaca College, New York. The daily S&P index has been retrieved for the same period, as well as the net asset value (NAV) of the 8 SCCEFs from the *Center* as well as the *FundEdge* database.

VI. THE MODEL AND STATISTICAL METHOD

To examine the research expectations presented above two statistical models along with graphs and correlation table are used:

Model 1:

$$Y_1 = B_0 + D + B_1X_{11} + B_2X_{12} + B_3X_{13} + B_4X_{14} + B_5D*X_{11} + B_6D*X_{12} + B_7D*X_{13} + B_8D*X_{14} + e \quad (1)$$

where Y_1 = ln SCCEF prices; D = Dichotomous variable to distinguish Study Period 1 (Jan 1996 - June 1997) and Study Period 2 (July 1997 - Dec 1997); X_{11} = ln S&P 500 Index; X_{12} = ln Regional CEF Price Index; X_{13} = ln Volume of Share Traded; X_{14} = ln Exchange Rate (currency/\$); $D*X_{11}$... $D*X_{14}$ = Interaction terms between D and X_{11} ... X_{14} ; B_0 ... B_8 = Regression Coefficients.

Model 2:

$$Y_2 = B_0 + D + B_1X_{21} + B_2X_{22} + B_3X_{23} + B_4X_{24} + B_5D*X_{21} + B_6D*X_{22} + B_7D*X_{23} + B_8D*X_{24} + e \quad (2)$$

where Y_2 = ln NAV; Independent variables are the same as above.

VII. RESULTS

Table 1 indicates the descriptive statistics of sixteen currency exchange rates during the Asian crisis period in comparison to the pre-crisis period. This larger number of currencies rather than the eight currencies specific to the SCCEFs under study are supposed to give an overall picture of the exchange

market of the period. The volatility and the magnitude of the depreciation of Korean Won, Indonesian Rupiah, Malaysian Ringgit, and Thai Baht were large, while Japanese Yen, Taiwan Dollars, Singapore Dollars, and Indian Rupees held their positions relatively well during this period. Several European currencies such as German Marks, Italian Lira, Spanish Pesetas and Swiss Francs also experienced significant depreciation, but the changes were not as large as the Asian currencies. The impact of the crisis was less in South America as shown by the relatively small decrease in Brazilian Reals, Chilean and Mexican Pesos.

Table 2 represents the change in SCCEF market prices and net asset values (NAVs) between the pre-crisis and the crisis periods. The results from these tables partially answer our first research question. The decreases in both market values and NAVs of SCCEFs in South Korea, Malaysia, and Thai were large, - ranging from -33% to -38% change in market price, and from -30% to -57% change in NAV.

Table 1
Currency rate change

	Pre-Crisis	Crisis		T-test	Pre-Crisis	Crisis	Pre-Crisis	Crisis
	Mean	Mean	Change %		Min	Min	Max	Max
Japanese Yen	112.54	118.99	5.73%	***	103.92	111.42	127.03	127.74
Korean Won	824.36	919.59	11.55%	***	768.90	884.70	893.70	1169.00
TaiwanDollars	27.43	28.91	5.38%	***	26.90	27.77	27.85	32.64
Indonesian Rupiah	2350.22	2940.20	25.10%	***	2293.33	2419.03	2447.31	3716.76
Malaysian Ringgit	2.51	2.92	16.22%	***	2.47	2.49	2.56	3.53
Singapore Dollars	1.42	1.50	6.29%	***	1.39	1.42	1.45	1.60
Thai Baht	25.51	32.88	28.91%	***	24.90	22.60	26.20	40.60
Indian Rupees	35.61	36.25	1.77%	***	34.10	35.71	38.05	39.10
Brazilian Reals	1.04	1.09	4.81%	***	1.01	1.07	1.07	1.11
Chilean Pesos	413.89	416.77	0.70%	***	402.20	411.40	428.00	436.50
Mexican Pesos	7.68	7.91	2.98%	***	7.33	7.72	8.05	8.41
German Marks	1.56	1.77	14.02%	***	1.44	1.71	1.73	1.88
Italian Lira	1576.47	1734.03	9.99%	***	1496.00	1675.50	1718.61	1840.75
Spanish Pesetas	131.08	149.78	14.27%	***	120.95	144.35	146.10	158.80
Swiss Francs	1.30	1.46	12.81%	***	1.16	1.39	1.49	1.54

Note: *** p<.0001

Table 2
SCCEF price and NAV change

	SCCEF Price				Net Asset Value			
	Pre-Crisis		Crisis		Pre-Crisis		Crisis	
	Mean	Mean	Change%	T-test	Mean	Mean	% Change	T-test
Korea Fund	18.53	12.28	-33.74%	***	17.03	11.85	-30.42%	***
ROC Taiwan	10.83	11.72	8.18%	***	11.21	14.67	30.86%	***
Malaysia Fund	18.53	11.74	-36.67%	***	20.36	11.21	-44.97%	***
Thai Fund	20.54	12.68	-38.28%	***	20.49	8.79	-57.12%	***
Mexico Fund	15.55	20.51	31.84%	***	18.55	25.67	38.38%	***
Brazil Fund	23.14	27.20	17.57%	***	26.33	33.72	28.09%	***
Germany Fund	12.39	14.85	19.87%	***	15.22	18.28	20.12%	***
Italy Fund	8.71	9.78	12.30%	***	10.37	11.97	15.41%	***

Note: *** p<.001

In contrast to Asian SCCEFs, the SCCEFs of other regions remained solid, and the prices and the NAVs of the SCCEFs significantly *increased* during the crisis period in comparison to the pre-crisis period. The South American and European funds were particularly bullish. The SCCEFs in South America grew on an average by more than 19% in market price and by nearly 33% in NAV. The average growth in European SCCEFs was also more than 12% both in price and NAV. Interestingly, the behavior of the Taiwan funds was remarkably similar to the South American funds with the significant increase in both the market price and the NAV. Taiwan was in a sense the "oasis" in the region in crisis.

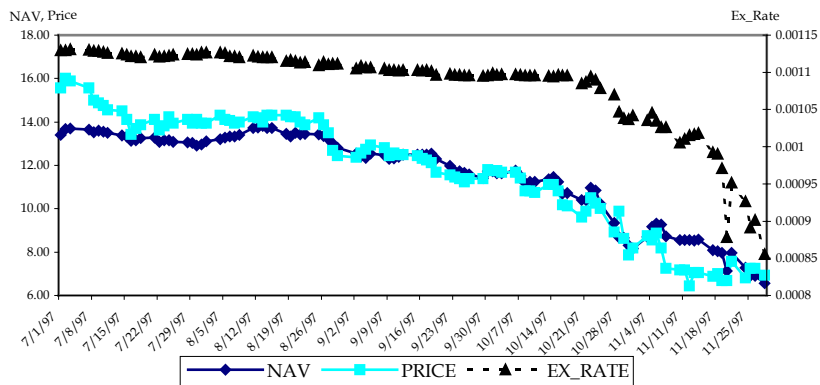
The results from Tables 1 and 2 may indicate that the depreciation of non-Asian currencies was most likely reactive to the Asian currency crisis, which was not properly incorporated in the changes in the SCCEFs market price nor NAV. Whereas, the catastrophic depreciation of the Asian currencies was largely the reflection of their weakening economic fundamentals, which, in turn, resulted in a quarter to more than a third reduction in market price and NAV of the Asian SCCEFs on average.

The graphs in Figures 1, 2, 3 and 4 depict the daily moves of NAVs, market prices of the 8 funds and exchange rates during the Asian currency crisis period. The figures give visual substantiation of the co-movements of the variables of the Asian funds and interesting views of other funds in line with the discussion of Tables 1 and 2.

The correlation results of NAV and exchange rate, and market price and exchange rate over the whole period and the two sub-periods are shown in Table 3. The results with the exception of Korea, Thai and Malaysia SCCEFs for the three periods and for the eight SCCEFs during the currency crisis period are not in line with our presumption. Other factors may be playing prominent role. These factors need to be accounted and controlled as much as possible to have a clear picture of the influence of exchange rate in the valuation of SCCEFs. As any other international portfolio investments, the performance of SCCEFs in terms of NAV and market price is influenced by general market conditions, regional economic conditions, exchange rates and interest of investors on SCCEFs, among others. The regression analysis is expected to address this issue.

Figure 1

Korea Fund: Daily Moves of NAV, Price and Exchange Rate



Taiwan ROC Fund: Daily Moves of NAV, Price, and Exchange Rate

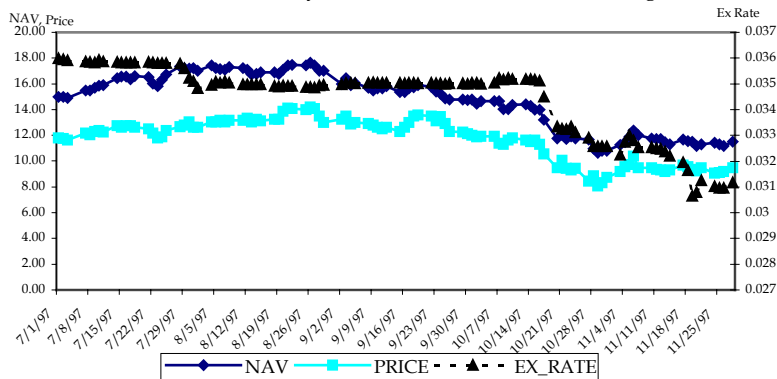
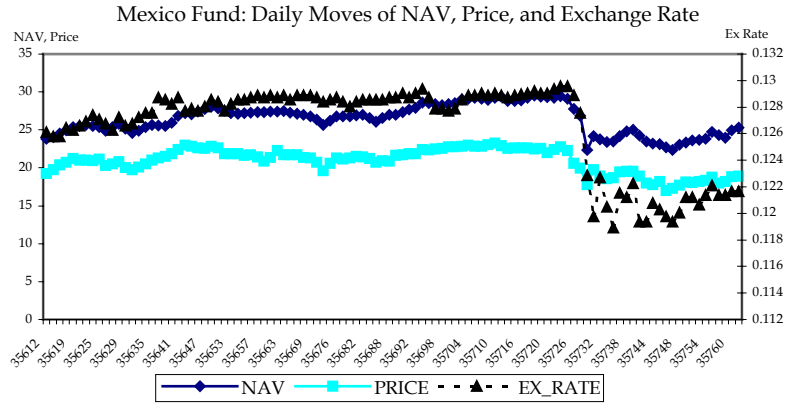


Figure 2



Brazil Fund: Daily Moves of NAV, Price, and Exchange Rate

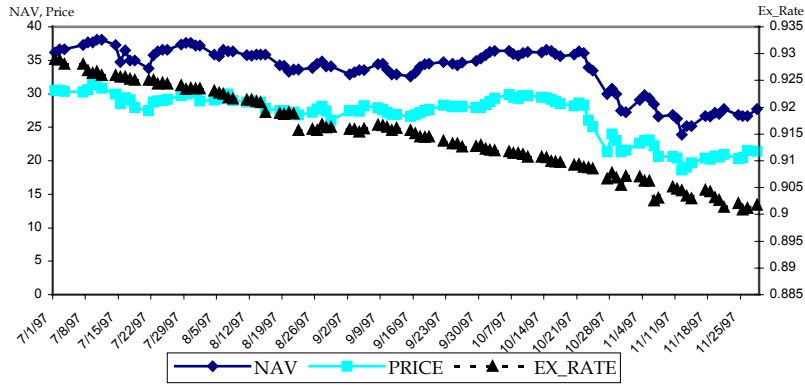
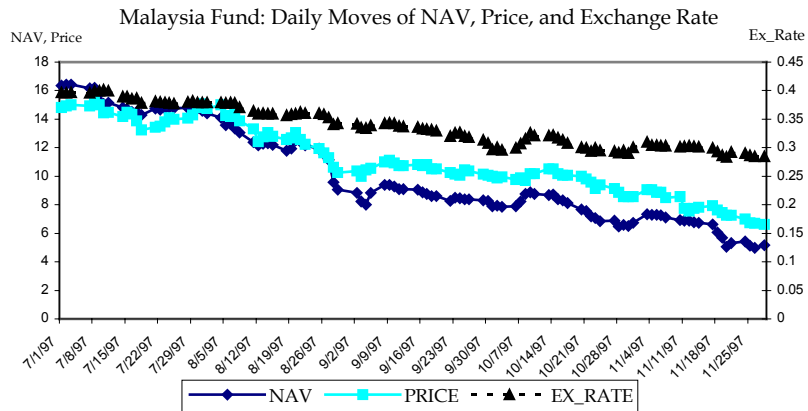


Figure 3



Thai Fund: Daily Moves of NAV, Price, and Exchange Rate

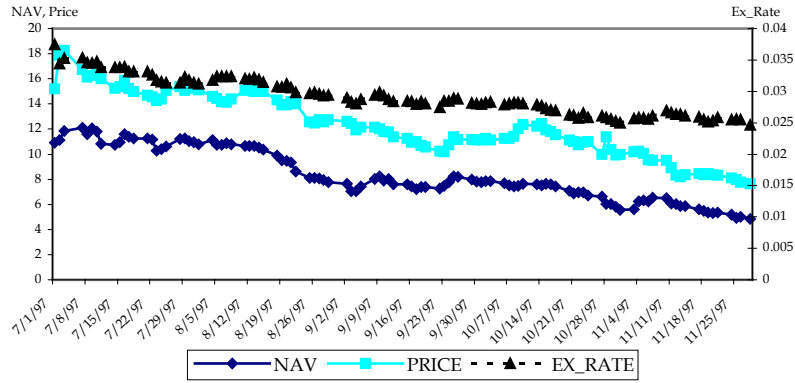
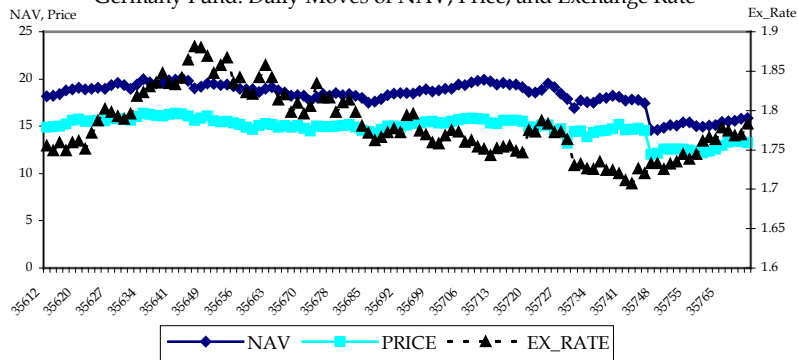


Figure 4

Germany Fund: Daily Moves of NAV, Price, and Exchange Rate



Italy Fund: Daily Moves of NAV, Price, and Exchange Rate

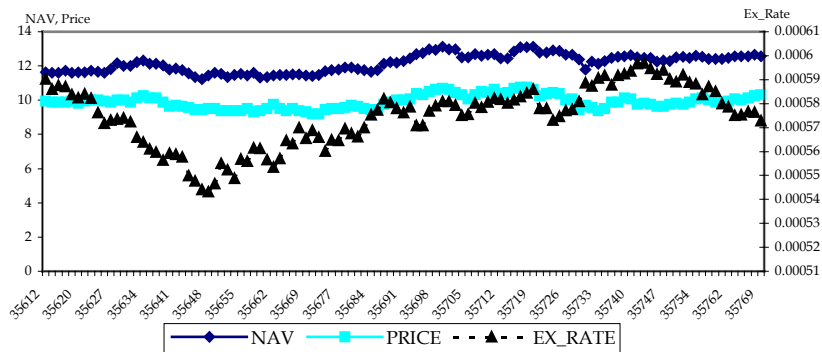


Table 3
Correlation analysis

	Korea	Taiwan	Thai	Malaysia	Mexico	Brazil	Italy	Germany
07/01/96 - 12/04/97 (Entire Period)	0.923 0.918	-0.104 0.201	0.771 0.788	0.925 0.897	-0.214 -0.128	-0.728 -0.616	-0.675 -0.676	0.769 0.786
07/01/96 - 06/30/97 (Pre-Crisis Period)	0.888 0.862	-0.557 -0.445	0.007 0.036	-0.003 0.049	-0.434 -0.228	-0.915 -0.889	-0.477 -0.498	0.701 0.699
07/01/97 - 12/04/97 (Crisis Period)	0.917 0.860	0.843 0.815	0.960 0.931	0.977 0.962	0.829 0.875	0.784 0.806	0.585 0.396	0.470 0.477

Note: Correlations between NAV and Exchange Rate are bolded.
Correlations between Price and Exchange Rate are not bolded.

Table 4
Results of the regression models

	ROC Taiwan Fund					Korea Fund				
	Pre-Crisis Period		Crisis Period		Diff.	Pre-Crisis Period		Crisis Period		Diff.
Model 1	Beta	Sig.	Beta	Sig.	Betas	Beta	Sig.	Beta	Sig.	Betas
Intercept	4.672	0.03	-4.684	0.04		24.963	0.00	8.475	0.00	
X1: SP500	0.307	0.00	1.115	0.00	***	-0.487	0.00	-0.767	0.00	ns
X2: Region	-0.483	0.00	0.751	0.00	***	0.095	0.06	1.464	0.00	***
X3: Volume	0.008	0.09	-0.025	0.00	***	-0.017	0.00	-0.013	0.07	ns
X4: Currency	-0.945	0.15	-0.619	0.18	ns	-2.829	0.00	-0.605	0.00	***
Model 2										
Intercept	-2.909	0.13	-6.462	0.00		27.720	0.00	10.848	0.00	
X1: SP500	1.288	0.00	1.146	0.00	ns	-0.501	0.00	0.010	0.93	***
X2: Region	-0.697	0.00	0.944	0.00	***	-0.147	0.00	0.737	0.00	***
X3: Volume	0.009	0.02	-0.023	0.01	***	-0.009	0.04	-0.015	0.00	ns
X4: Currency	-0.429	0.46	-0.228	0.61	ns	-3.154	0.00	-1.479	0.00	***
	Malaysia Fund					Thai Fund				
	Pre-Crisis Period		Crisis Period		Diff.	Pre-Crisis Period		Crisis Period		Diff.
Model 1	Beta	Sig.	Beta	Sig.	Betas	Beta	Sig.	Beta	Sig.	Betas
Intercept	5.598	0.00	2.619	0.02		16.952	0.00	3.906	0.06	
X1: SP500	-0.440	0.00	-0.094	0.59	ns	-1.158	0.00	-0.603	0.09	*
X2: Region	0.472	0.00	0.747	0.00	**	0.700	0.00	1.259	0.00	***
X3: Volume	-0.019	0.00	-0.018	0.00	ns	-0.025	0.00	0.010	0.42	***
X4: Currency	-0.979	0.02	-1.122	0.00	ns	-2.469	0.00	-0.092	0.40	***
Model 2										
Intercept	8.453	0.00	7.277	0.00		28.368	0.00	3.098	0.13	
X1: SP500	-0.506	0.00	-0.531	0.02	ns	-1.976	0.00	-0.363	0.30	***
X2: Region	0.145	0.01	0.594	0.00	***	0.610	0.00	1.363	0.00	***
X3: Volume	-0.016	0.00	-0.035	0.00	*	-0.029	0.00	-0.034	0.01	ns
X4: Currency	-2.621	0.00	-2.324	0.00	ns	-4.267	0.00	-0.427	0.00	***

Table 4 (Continued)

	Mexico Fund				Diff.	Brazil Fund				Diff.
	Pre-Crisis Period		Crisis Period			Pre-Crisis Period		Crisis Period		
Model 1	Beta		Beta		Betas	Beta	Sig.	Beta	Sig.	Betas
Intercept	0.956	0.00	-5.619	0.00		1.090	0.00	1.875	0.01	
X1: SP500	0.814	0.00	1.597	0.00	***	-0.109	0.03	-0.344	0.01	ns
X2: Region	0.209	0.00	0.270	0.00	ns	0.945	0.00	1.294	0.00	***
X3: Volume	0.011	0.00	-0.002	0.66	*	0.000	0.88	-0.002	0.54	ns
X4: Currency	-2.070	0.00	-1.469	0.00	*	2.860	0.00	0.354	0.55	***
Model 2										
Intercept	-0.777	0.00	-2.941	0.02		1.641	0.00	1.083	0.15	
X1: SP500	1.102	0.00	1.741	0.00	***	-0.103	0.05	-0.171	0.20	ns
X2: Region	0.041	0.42	-0.143	0.03	*	0.786	0.00	1.188	0.00	***
X3: Volume	-0.006	0.06	-0.001	0.87	ns	0.002	0.36	0.004	0.19	ns
X4: Currency	-1.765	0.00	-2.555	0.00	**	3.466	0.00	1.489	0.01	***
	Italy Fund				Diff.	Germany Fund				Diff.
	Pre-Crisis Period		Crisis Period			Pre-Crisis Period		Crisis Period		
Model 1	Beta	Sig.	Beta	Sig.	Betas	Beta	Sig.	Beta	Sig.	Betas
Intercept	-0.363	0.34	-0.682	0.35		-0.664	0.04	0.641	0.52	
X1: SP500	0.338	0.00	1.044	0.00	***	0.342	0.00	-0.139	0.37	***
X2: Region	0.139	0.05	0.377	0.00	*	0.352	0.00	0.809	0.00	***
X3: Volume	0.011	0.00	0.000	0.97	**	0.006	0.02	-0.010	0.19	**
X4: Currency	-0.016	0.84	-0.704	0.00	***	-0.113	0.08	1.316	0.00	***
Model 2										
Intercept	1.217	0.00	0.342	0.66		-1.054	0.00	1.373	0.21	
X1: SP500	0.551	0.00	1.511	0.00	***	0.481	0.00	-0.164	0.34	***
X2: Region	0.160	0.02	-0.165	0.03	**	0.239	0.00	0.681	0.00	***
X3: Volume	0.007	0.00	0.001	0.63	ns	0.006	0.02	-0.016	0.05	***
X4: Currency	-0.402	0.00	-1.035	0.00	***	-0.134	0.03	1.393	0.00	***

Note: Differences in coefficients between the pre-crisis and the crisis periods are tested by interaction terms. Only significance levels are reported here. *** p<.001; ** p<.01; * p<.05.

VIII. REGRESSION ANALYSIS RESULTS

In this section, the results of the two regression models presented in Table 4 are discussed to answer the second question of the study. That is, how change in exchange rates affected SCCEFs' prices and NAVs in the periods preceding and during the crisis.

If the depreciation of the currencies is rationally incorporated in the reduction of the SCCEFs' prices and NAVs as predicted, we should observe significant beta coefficients in the negative direction in the results of Model 1 and Model 2 tests. During the pre-crisis period, 7 out of 8 funds' prices and NAVs have negative exchange rate coefficients. Four of these coefficients are statistically significant for price and five for NAV. During the crisis period six

of the exchange rate coefficients for price and NAV are negative. Four for price and five for NAV are statistically significant. However, the Brazil fund and the German funds did not confirm we anticipated. This may be due to a relatively small depreciation of these two currencies not fundamentally justified but sympathetically responding to the Asian currency depreciation.

The possible significant change in the power of the exchange rate to explain the market price and the NAV movements between the pre-crisis and the crisis periods has been tested by the interaction term in Model 1 and Model 2. Most of the coefficients associated with the interaction terms have not been significant. The direction of the change has been inconsistent, indicating that there is little change in the impact of the exchange rate on the SCCEF's price or NAV during the crisis period in comparison to the pre-crisis period.

IX. CONCLUSION

This work has found evidence that supports that translation exposure is quickly incorporated by management in the determination of NAVs. In addition, investors also consider change in exchange rate in determining the market price of SCCEFs. From the differential information holding perspective, it is argued that amid the currency crisis, most individual investors faced difficulty in accurately understanding the speed and the magnitude of the depreciation of the currency and the values of the securities that make up the SCCEFs. As a result, the reduction of the SCCEF's price may not have occurred as quickly as the NAV.

In summary, the recent Asian currency crisis has offered us an interesting quasi-experimental situation, where we have observed extremely rapid depreciation of the net asset values of the underlying securities of SCCEFs in Asia and fast appreciation of the NAVs in other regions. In both cases, the market prices of SCCEFs have been mostly adjusted at a much slower pace, which resulted in the significant shrinkage in the discounts in Asia and an increase in the discounts in other regions. The different results presented confirm that translation exposure is important in the valuation of SCCEFs. The results also confirm to a large extent that NAV leads market price in incorporating the impact of translation exposure. The limitation of this study is the sample size. As more daily data on NAV becomes available the sample size can be increased and the questions can be revisited to give validity to the findings of our research.

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